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<110> Mahajan, Pramod B.
Zuo, Zhuang

<120> Poly ADP-Ribose Polymerase Gene and Its Uses

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<141> 1999-01-26

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<170> PatentIn Ver. 2.1

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20 25 30

cgt ctt ggc aag atg gtt cag gcg tca cag ttc gac ggc ttc atg ccg 144

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35 40 45

RECEIVED

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Met Trp Asn His Ala Arg Cys Ile Phe Ser Lys Lys Asn Gln Ile Lys
50 55 60

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240

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Glu Lys Ile Arg Asn Tyr Val Gly Ser Ala Ser Ala Gly Thr Ser Ser
85 90 95

288

aca gct gct cct cct gag aaa tgt aca att gag att gct cca tct gcc
Thr Ala Ala Pro Pro Glu Lys Cys Thr Ile Glu Ile Ala Pro Ser Ala
100 105 110

336

cgt act tca tgt aga cga tgc agt gaa aag att aca aaa gga tcg gtc
Arg Thr Ser Cys Arg Arg Cys Ser Glu Lys Ile Thr Lys Gly Ser Val
115 120 125

384

cgt ctt tca gct aag ctt gag agt gaa ggt ccc aag ggt ata cca tgg
Arg Leu Ser Ala Lys Leu Glu Ser Glu Gly Pro Lys Gly Ile Pro Trp
130 135 140

432

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Tyr His Ala Asn Cys Phe Phe Glu Val Ser Pro Ser Ala Thr Val Glu
145 150 155 160

480

aag ttc tca ggc tgg gat act ttg tcc gat gag gat aag aga acc atg
Lys Phe Ser Gly Trp Asp Thr Leu Ser Asp Glu Asp Lys Arg Thr Met
165 170 175

528

ctc gat ctt gtt aaa aaa gat gtt ggc aac aat gaa caa aat aag ggt
Leu Asp Leu Val Lys Lys Asp Val Gly Asn Asn Glu Gln Asn Lys Gly
180 185 190

576

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195 200 205

624

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Arg Leu Asp Glu Ser Thr Ser Glu Gly Thr Val Arg Asn Lys Gly Gln
210 215 220

672

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720

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Lys Leu Lys Glu Gln Ser Asp Thr Leu Trp Lys Leu Lys Asp Gly Leu			
245	250	255	
aag act cat gta tcg gct gct gaa tta agg gat atg ctt gag gct aat			816
Lys Thr His Val Ser Ala Ala Glu Leu Arg Asp Met Leu Glu Ala Asn			
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Gly Gln Asp Thr Ser Gly Pro Glu Arg His Leu Leu Asp Arg Cys Ala			
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gat gga atg cta ttt gga gcg ctg ggt cct tgc cca gtc tgt gct aat			912
Asp Gly Met Leu Phe Gly Ala Leu Gly Pro Cys Pro Val Cys Ala Asn			
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ggc atg tac tat tat aat ggt cag tac caa tgc agt ggt aat gtg tca			960
Gly Met Tyr Tyr Tyr Asn Gly Gln Tyr Gln Cys Ser Gly Asn Val Ser			
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gag tgg tcc aag tgt aca tac tct gcc aca gaa cct gtc cgc gtt aag			1008
Glu Trp Ser Lys Cys Thr Tyr Ser Ala Thr Glu Pro Val Arg Val Lys			
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Trp Phe Lys Ser Gln Lys Val Lys Lys Pro Glu Arg Val Leu Pro Pro			
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Leu Ser Ser Lys Gly Leu Asp Lys Leu Arg Phe Ser Val Val Gly Gln			
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Ser Lys Glu Ala Ala Asn Glu Trp Ile Glu Lys Leu Lys Leu Ala Gly			
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gcc aac ttc tat gcc agg gtt gtc aaa gat att gat tgt tta att gca			1296

Ala Asn Phe Tyr Ala Arg Val Val Lys Asp Ile Asp Cys Leu Ile Ala			
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Cys Gly Glu Leu Asp Asn Glu Asn Ala Glu Val Arg Lys Ala Arg Arg			
435	440	445	
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Leu Lys Ile Pro Ile Val Arg Glu Gly Tyr Ile Gly Glu Cys Val Lys			
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Cys Ser Xaa Ser Pro Xaa Val Cys Lys Asn Thr Ala His Ile Pro Xaa			
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gra tgg gaa aag cat ata caa tgc amc ctt aaa cat gtt ctg acc tgn			1584
Xaa Trp Glu Lys His Ile Gln Cys Xaa Leu Lys His Val Leu Thr Xaa			
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cac nag gtg tgy aca ggc tac tat gta ctc cag atc att gaa cag gat			1632
His Xaa Val Cys Thr Gly Tyr Val Leu Gln Ile Ile Glu Gln Asp			
530	535	540	
gat ggg tct gag tgc tac gta ttt cgt aag tgg gga cgg gtt ggg agt			1680
Asp Gly Ser Glu Cys Tyr Val Phe Arg Lys Trp Gly Arg Val Gly Ser			
545	550	555	560
gag aaa att gga ggg caa aaa ctg gag gag atg tca aaa act gag gca			1728
Glu Lys Ile Gly Gly Gln Lys Leu Glu Glu Met Ser Lys Thr Glu Ala			
565	570	575	
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Ile Lys Glu Phe Lys Arg Leu Phe Leu Glu Lys Thr Gly Asn Ser Trp			
580	585	590	
gaa gct tgg gaa tgt aaa acc aat ttt cgg aag cag cct ggg aga ttt			1824
Glu Ala Trp Glu Cys Lys Thr Asn Phe Arg Lys Gln Pro Gly Arg Phe			
595	600	605	
tac cca ctt gat gtt gat tat ggt gtt aag aaa gca cca aaa cgaa			1872

Tyr Pro Leu Asp Val Asp Tyr Gly Val Lys Lys Ala Pro Lys Arg Lys				
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Asp Ile Ser Glu Met Lys Ser Ser Leu Ala Pro Gln Leu Leu Glu Leu				
625	630	635	640	
atg aag atg ctt ttc aat gtg gag aca tat aga gct gct atg atg gaa				1968
Met Lys Met Leu Phe Asn Val Glu Thr Tyr Arg Ala Ala Met Met Glu				
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Phe Glu Xaa Asn Met Ser Glu Met Pro Leu Gly Lys Leu Ser Xaa Xaa				
660	665	670		
aat att gag raa gga ttt gaa gca tta act krg rta cmg rat tta ttt				2064
Asn Ile Glu Xaa Gly Phe Glu Ala Leu Thr Xaa Xaa Xaa Xaa Leu Phe				
675	680	685		
gaa gga cac cgc tna tca agc act ggc ttg ttr gag aaa gct naa ttg				2112
Glu Gly His Arg Xaa Ser Ser Thr Gly Leu Xaa Glu Lys Ala Xaa Leu				
690	695	700		
ttg ytg sga gcm ats syt ttt tca ctc tta tcc ctt cta ttc atc ctc				2160
Leu Xaa Xaa Xaa Xaa Phe Ser Leu Leu Ser Leu Leu Phe Ile Leu				
705	710	715	720	
ata tta tac ggg atg agg atg att tca tat tca aag gcg aaa atg ctt				2208
Ile Leu Tyr Gly Met Arg Met Ile Ser Tyr Ser Lys Ala Lys Met Leu				
725	730	735		
gaa gct ctg cag gat att gaa att gct tca aag ata gtt ggc ttc gat				2256
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740	745	750		
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Ser Asp Ser Asp Glu Ser Leu Asp Asp Lys Tyr Met Lys Leu His Cys				
755	760	765		
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Asp Ile Thr Pro Leu Ala His Asp Ser Glu Asp Tyr Lys Leu Ile Glu				
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Gln Tyr Leu Leu Asn Thr His Ala Pro Thr His Lys Asp Trp Ser Leu				
785	790	795	800	
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Asp	Arg	Asn	Asn	Pro	Val	Gly	Leu	Met	Leu	Leu	Ser	Glu	Val	Ala	Leu	
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Gly	Asp	Met	Tyr	Glu	Leu	Lys	Lys	Ala	Thr	Ser	Met	Asp	Lys	Pro	Pro	
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tca gag ttt gtg aag tgg agg gat gat gtc gta gtt ccc tgc ggc aag															2832	
Ser	Glu	Phe	Val	Lys	Trp	Arg	Asp	Asp	Val	Val	Val	Pro	Cys	Gly	Lys	
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Pro	Val	Pro	Ser	Ser	Ile	Arg	Ser	Ser	Glu	Leu	Met	Tyr	Asn	Glu	Tyr	
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35 40 45
Met Trp Asn His Ala Arg Cys Ile Phe Ser Lys Lys Asn Gln Ile Lys
50 55 60
Ser Val Asp Asp Val Glu Gly Ile Asp Ala Leu Arg Trp Asp Asp Gln
65 70 75 80
Glu Lys Ile Arg Asn Tyr Val Gly Ser Ala Ser Ala Gly Thr Ser Ser
85 90 95
Thr Ala Ala Pro Pro Glu Lys Cys Thr Ile Glu Ile Ala Pro Ser Ala
100 105 110
Arg Thr Ser Cys Arg Arg Cys Ser Glu Lys Ile Thr Lys Gly Ser Val
115 120 125
Arg Leu Ser Ala Lys Leu Glu Ser Glu Gly Pro Lys Gly Ile Pro Trp
130 135 140
Tyr His Ala Asn Cys Phe Phe Glu Val Ser Pro Ser Ala Thr Val Glu
145 150 155 160
Lys Phe Ser Gly Trp Asp Thr Leu Ser Asp Glu Asp Lys Arg Thr Met
165 170 175
Leu Asp Leu Val Lys Lys Asp Val Gly Asn Asn Glu Gln Asn Lys Gly
180 185 190
Ser Lys Arg Lys Lys Ser Glu Asn Asp Ile Asp Ser Tyr Lys Ser Ala
195 200 205
Arg Leu Asp Glu Ser Thr Ser Glu Gly Thr Val Arg Asn Lys Gly Gln
210 215 220
Leu Val Asp Pro Arg Gly Ser Asn Thr Ser Ser Ala Asp Ile Gln Leu
225 230 235 240
Lys Leu Lys Glu Gln Ser Asp Thr Leu Trp Lys Leu Lys Asp Gly Leu
245 250 255
Lys Thr His Val Ser Ala Ala Glu Leu Arg Asp Met Leu Glu Ala Asn
260 265 270
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275 280 285
Asp Gly Met Leu Phe Gly Ala Leu Gly Pro Cys Pro Val Cys Ala Asn
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Gly Met Tyr Tyr Tyr Asn Gly Gln Tyr Gln Cys Ser Gly Asn Val Ser
305 310 315 320
Glu Trp Ser Lys Cys Thr Tyr Ser Ala Thr Glu Pro Val Arg Val Lys
325 330 335

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 340 345 350
 Trp Phe Lys Ser Gln Lys Val Lys Lys Pro Glu Arg Val Leu Pro Pro
 355 360 365
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 370 375 380
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 385 390 395 400
 Ser Lys Glu Ala Ala Asn Glu Trp Ile Glu Lys Leu Lys Leu Ala Gly
 405 410 415
 Ala Asn Phe Tyr Ala Arg Val Val Lys Asp Ile Asp Cys Leu Ile Ala
 420 425 430
 Cys Gly Glu Leu Asp Asn Glu Asn Ala Glu Val Arg Lys Ala Arg Arg
 435 440 445
 Leu Lys Ile Pro Ile Val Arg Glu Gly Tyr Ile Gly Glu Cys Val Lys
 450 455 460
 Arg Thr Lys Cys Cys His Leu Ile Cys Ile Asn Trp Asn Ala Leu Glu
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 485 490 495
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 580 585 590
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 595 600 605
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 610 615 620
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 625 630 635 640
 Met Lys Met Leu Phe Asn Val Glu Thr Tyr Arg Ala Ala Met Met Glu
 645 650 655
 Phe Glu Xaa Asn Met Ser Glu Met Pro Leu Gly Lys Leu Ser Xaa Xaa
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 675 680 685
 Glu Gly His Arg Xaa Ser Ser Thr Gly Leu Xaa Glu Lys Ala Xaa Leu
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Ile Leu Tyr Gly Met Arg Met Ile Ser Tyr Ser Lys Ala Lys Met Leu
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 Glu Ala Leu Gln Asp Ile Glu Ile Ala Ser Lys Ile Val Gly Phe Asp
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 Ser Asp Ser Asp Glu Ser Leu Asp Asp Lys Tyr Met Lys Leu His Cys
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 Asp Ile Thr Pro Leu Ala His Asp Ser Glu Asp Tyr Lys Leu Ile Glu
 770 775 780
 Gln Tyr Leu Leu Asn Thr His Ala Pro Thr His Lys Asp Trp Ser Leu
 785 790 795 800
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 Tyr Ser Arg Tyr Lys Asn Asn Leu His Asn Lys Met Leu Leu Trp His
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 Arg Gly Lys His Ser Thr Lys Gly Leu Gly Lys Thr Val Pro Leu Glu
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 Ser Glu Phe Val Lys Trp Arg Asp Asp Val Val Val Pro Cys Gly Lys
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 Pro Val Pro Ser Ser Ile Arg Ser Ser Glu Leu Met Tyr Asn Glu Tyr
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Leu	Leu	Ser	Glu	Val	Ala	Leu	Gly	Asp	Met	Tyr	Glu	Leu	Lys	Lys	Ala	
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acg tcc atg gac aaa cct cca aga ggg aag cat tcg acc aag gga tta															288	
Thr	Ser	Met	Asp	Lys	Pro	Pro	Arg	Gly	Lys	His	Ser	Thr	Lys	Gly	Leu	
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ggc aaa acc gtg cca ctg gag tca gag ttt gtg aag tgg agg gat gat															336	
Gly	Lys	Thr	Val	Pro	Leu	Glu	Ser	Glu	Phe	Val	Lys	Trp	Arg	Asp	Asp	
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gtc gta gtt ccc tgc ggc aag ccg gtg cca tca tca att agg agc tct															384	
Val	Val	Val	Pro	Cys	Gly	Lys	Pro	Val	Pro	Ser	Ser	Ile	Arg	Ser	Ser	
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gaa ctc atg tac aat gag tac atc gtc tac aac aca tcc cag gtg aag															432	
Glu	Leu	Met	Tyr	Asn	Glu	Tyr	Ile	Val	Tyr	Asn	Thr	Ser	Gln	Val	Lys	
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atg cag ttc ttg ctg aag gtg cgt ttc cat cac aag agg tag															474	
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 Leu Leu Ser Glu Val Ala Leu Gly Asp Met Tyr Glu Leu Lys Lys Ala
 65 70 75 80
 Thr Ser Met Asp Lys Pro Pro Arg Gly Lys His Ser Thr Lys Gly Leu
 85 90 95
 Gly Lys Thr Val Pro Leu Glu Ser Glu Phe Val Lys Trp Arg Asp Asp
 100 105 110
 Val Val Val Pro Cys Gly Lys Pro Val Pro Ser Ser Ile Arg Ser Ser
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